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BY ORDER OF THE COMMANDER, PACIFIC AIR FORCES
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Weather
WEATHER MANAGEMENT GUIDE
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This pamphlet implements AFPD 15-1, Atmospheric and Space Environmental Support. It is designed to provide operations group commanders (OG/CC), operations support squadron commanders (OSS/CC), air support operations group and squadron (ASOG & ASOS, respectively) commanders a quick reference to help them better manage their weather units flight safety and resource protection missions. The purpose of this primer is to give the commander some insight into several key areas that are important aspects of the base (or post) weather station. In addition to the weather segment of the group and squadron commanders' course, this pamphlet will prepare base leaders to better manage their weather flights. It is broken into several short sections on: the weather reengineering program, training and certification, publications and references, visit programs, metrics programs, and weather equipment. If additional information is required, please write or call the PACAF/DOWV at DSN 448-9282. In addition, weather personnel may also find this pamphlet to be a useful, quick reference.

SUMMARY OF REVISIONS

This Document is substantially revised and should be completely reviewed.

Section A - Weather Reengineering

1.1. PACAF Weather units are undergoing the largest organizational change in many years. This change, known as Air Force Weather Reengineering, changes the operational focus of the weather flight from general forecasting services to customer specific forecast services. Observing services will remain relatively unchanged. Primary forecast responsibility (i.e., Terminal Aerodrome Forecast, Weather Warnings and Watches, and Weather Advisories) will shift from the weather flight to the Operational Weather Squadron (OWS). For more information concerning AFW reengineering, please contact HQ PACAF/DOWO at 448-1533.

1.2. The weather reengineering program will also affect existing technical training and proficiency training. In the past, Airmen typically attended observing school and, upon graduation, went directly to a weather flight or any of the other weather centers, or organizations supported by Air Force Weather. Upon completion of reengineering, pipeline technical school graduates will receive instruction that provides the basics in forecasting and observing. These graduates will PCS directly to an Operational Weather Squadron. Here, senior forecasters and certified trainers will assist with OJT. When a tour at an OWS is complete, the individual will be sent back to technical school for more training. Only after successfully completing the second technical course will an airman be assigned to a PACAF weather flight.

1.3. Operational Weather Squadron. Current plans specify the requirement for four OWSs in PACAF:

1.3.1. 11 OWS, Elmendorf AFB, AK. This OWS has forecast responsibilities for the 11 AF area of responsibility (AOR), to include, but not exclusive to, Elmendorf AFB, AK; Eielson AFB, AK; and Ft Wainwright AK.
1.3.2. 20 OWS, Yokota AB, Japan. This OWS has forecast responsibilities for 5 AF AOR to include, but not exclusive to, Yokota AB, Japan; Misawa AB, Japan; Kadena AB, Japan; and Camp Zama Japan.
1.3.3. 607 WS, Yongsan AIN, Korea. This OWS has forecast responsibilities for 7 AF AOR and 8 USA to include all 607 WS Detachments and Operating Locations, as well as for Osan AB, Korea, and Kunsan AB, Korea.
1.3.4. 17 OWS, Hickam AFB, HI. This OWS has forecast responsibility for 13 AF AOR and Hickam AFB, HI; Wheeler AAF, HI; Bradshaw AAI, HI; Johnston Island, and Andersen AFB, Guam.

Section B - Training & Certification

2.1. General. The following provides a broad outline of weather training and guidance available to PACAF weather flights. HQ PACAF/DOWO is the OPR for assisting units in fulfilling their weather training needs.

2.2. Core Training Courses:
2.2.1. Enlisted:
2.2.1.1. Weather Apprentice Course. The Weather Forecaster Apprentice course is 20 weeks long. This course provides initial training for personnel entering the weather career field. Personnel receive training in the fundamentals of meteorology, weather observing codes, satellite meteorology, weather chart analysis, weather equipment operations, computer operations, weather radar, weather feature prognosis, weather products, weather forecasting, and weather stations operations. There are no course prerequisites or special requirements. The course awards 40 Community College of the Air Force (CCAF) credits. Graduates of this course typically PCS directly to an OWS.
2.2.1.2. Weather Flight Course. The Weather Flight Course is planned to provide additional training to for Weather Apprentice Course graduates prior to assignment to a weather flight. The course will provide additional skills such as: tactical decision aids, mission execution forecast preparation, and enhanced observing skills. This course will be a career field mandatory course, but not an AFSC awarding course. Graduates of this course PCS for the first time to a non-OWS weather unit.
2.2.1.3. Weather Craftsman Course (7-level school). This course teaches the tasks, principles, and concepts identified through line items in the current Career Field Education and Training Plan (CFETP). Instruction prepares students to meet entry and mid-level management challenges. Topics include duty schedules, the Quality Assurance and Technical Health Program, SOPs & OIs, weather support plans, Terminal Forecast Reference Notebook (TFRN), Local Analysis and Forecast Plan (LAFP), Terminal Aerodrome Forecast (TAF) worksheet, as well as AFW products and services. Students are encouraged to bring any of the following: TFRN, LAFP, TAF worksheet, and duty schedule. This course is mandatory for upgrade into the 7-skill level. The course runs 80 hours and awards four CCAF credits.
2.2.1.4. Weather Forecast Course. The course is 22 weeks of classroom and lab. The initial 19 weeks of the course provides training on tasks and knowledge necessary for Airmen, Sailors, and Marines to perform duties as Weather Analysts, Aerographers and Oceanographers in the weather career field. Those tasks are to prepare and issue short range weather forecasts and weather warnings, present weather briefings based on centrally prepared forecasts and charts, and prepare climatological and historical weather data. Major topics covered are physics, synoptic meteorology, climatology, analysis of weather maps and charts, preparation of short range weather forecasts, use of radar and satellite imagery, preparation and presentation of weather

briefings required for operating weather stations are major topics. The final 3 weeks of the course prepares AF students with the knowledge and skills necessary to perform duties in a combat weather flight. The first week is dedicated to staff and warfare support, interpreting climatological data, basic streamline analysis, atmospheric model interpretation, and numerical weather forecast product usage. The remaining 2 weeks provide instruction on the New-Tactical Forecast System (N-TFS), flight weather briefings, pilot-to-metro-service, mission control forecasts, and issuing weather warnings and advisories. Qualification in AFSC 1W051 is a prerequisite for the course. There are no special requirements for the course. The course awards 51 CCAF credits. Graduates of this course may PCS to any weather unit (e.g., OWS, weather flight). The AFSC "A" suffix is awarded upon completion of this course. As part of the AFW reengineering effort the last class scheduled for this course will be in Oct 2002.

2.2.2. Officer: The Weather Officer Course. The Weather Officer Course is required for the award of Air Force Specialty Code 15W1. Main topics of instruction include career development, weather support, electro-optics, thermodynamics, weather chart analysis, satellite imagery interpretation, space weather, observing, tropical meteorology, oceanography, aviation hazards, numerical weather prediction, field skills, radar meteorology, N-TFS, and Forecast Laboratory.

2.3. Supplemental Courses:

2.3.1. Enlisted/Officer (In-residence):

2.3.1.1. HQ PACAF/DOW coordinates en route training needs for inbound PACAF weather personnel and attempts to satisfy the training requirements identified by all PACAF weather flights. HQ AETC funds these courses subject to funding availability. Weather flights may pursue additional training quotas through self-funded efforts. Listed below are the in-residence weather training courses available at Keesler AFB, MS. These courses are generally 1 to 5 weeks in duration.

2.3.1.1.1. Tropical Weather Analysis and Forecasting. This three-week course for military weather forecasters is essential to analyze and forecast tropical weather. Streamlining techniques are employed for the analysis of satellite and conventional data. The climatology, dynamics, and structure of tropical systems are strongly emphasized. Award of AFSC 15WX or 1W0X1A are prerequisites for this course. There are no special requirements. The course awards two CCAF credits.

2.3.1.1.2. Environmental Support for Electro Optics. This distance learning course will be taught from Keesler AFB to students at job site locations. The course will begin with a foundation of the basic physics of radiative transfer. The student will learn how to apply the physics of radiative transfer to what forecasters already know about the atmosphere. The course also includes training on the principles of target acquisition systems and precision guided munitions, and practice on the Target Acquisition Weather Software (TAWS). Award of AFSC 15WX or 1W0X1A are prerequisites for the course. Special requirements: local education centers must have the capability to receive the broadcast. Currently only those centers in Hawaii and Alaska have the capability. Future plans for communications upgrades should bring this capability to Japan, Korea and Guam. Some education service organizations at other DOD installations also provide this capability to AF personnel.

2.3.1.1.3. WSR-88D (NEXRAD) Principle User Processor Operator/Manager. This course is 22 academic days of classroom and lab combined, providing training in the knowledge and skills needed to operate and interpret data originating from the WSR-88D Weather Radar System using the Principle User Processor (PUP). Coursework includes operational theory of the WSR-88D, operation of the PUP, interpreting WSR-88D products, and operational and equipment management of the PUP. Radar experience is not required to attend this course. There are no prerequisites for this course. There are no special requirements. The course awards 10 CCAF credits.

2.3.1.1.4. WSR-88D (NEXRAD) Unit Control Position Operator/Manager. This course is 5 academic days of classroom and lab combined, providing training in the knowledge and skills needed to operate the WSR-88D Unit Control Position (UCP) terminal. Coursework includes optimizing system performance, configuring the UCP, and operational and equipment management. Prerequisites include AFSC 15WX or 1W0XX, successful completion of the WSR-88D PUP Operator/Manager course, or a similar course offered by the Operational Support Facility, Norman OK. There are no special requirements. The course awards two CCAF credits.
2.3.1.1.5. N-TFS System Manager. This course is 2 weeks of lecture and performance objectives. In the first week, hands-on computer operation exercises will broaden the student's knowledge of advanced operator topics such as Command Sequences, Loop Sequences, Locally Generated Grids, Barne's Objective Analysis Techniques, and Severe Weather Algorithms. In the second week the student will be required to configure System Manager Configuration Tables for optimum proficiency to meet operational needs. Course materials are oriented toward management and analysis of the N-TFS. Prerequisites include forecasting experience and an extensive operational knowledge of the N-TFS. There are no special requirements. The course awards four CCAF credits.
2.3.1.2. Staff Weather Officer Army Indoctrination. Offered by the Army at Fort Huachuca, AZ, this course is available for weather officers and senior noncommissioned officers. Army personnel present the instruction. The course prepares AF weather personnel for Army staff support, and familiarizes weather personnel with Army operations.
2.3.2. In-station Training Capability:
2.3.2.1. PACAF weather flights that have not yet been reengineered have a supervisory structure that allows them to administer their workcenter training programs, including upgrade and job-knowledge training. The weather flight enlisted specialty training monitor along with the flight NCOIC (Superintendent) oversee the training program under the technical leadership of the flight's officer personnel. Weather flights can refer to AFI 36-2201, Developing, Managing, and Conducting Training, and the 1W0X1/A Career Field Education and Training Plan (CFETP) for further guidance on conducting training programs.
2.3.2.2. PACAF weather flights that have been reengineered do not have the 5-level upgrade training requirements stated in the above paragraph. The Operational Weather Squadron will perform upgrade training to the 5-level.
2.3.2.3. Qualification Training Program (QTP). Developed by AFWA, the program includes blocks on core tasks standard to most weather units. A QTP qualifies someone on a particular subject area corresponding to individual line item(s) in the AF Weather CFETP, Part II. The CFETP includes a QTP column in Part II to indicate if this training method is available to locally qualify an individual on a given subject area. If a QTP exists for a particular subject for which there is a corresponding supplemental course, the supplemental course will eventually be discontinued. Completion of each QTP is required for certification. See AFWA/DNT for a complete list of QTPs. Currently, QTPs are available in the following subjects:
2.3.2.3.1. Climatology.
2.3.2.3.2. Forecast Models.
2.3.2.3.3. Observing.
2.3.2.3.4. PMSV.
2.3.2.3.5. Synoptic Meteorology Regimes.
2.3.2.3.6. Weather Briefings.
2.3.2.3.7. MARWIN (Mini-Marine RAWIN).
2.3.2.3.8. WSR 88D, Weather Surveillance Radar.
2.3.2.3.9. Analysis and Prognosis.
2.3.2.3.10. Meteorological Satellites.

2.4. Certification of Weather Personnel:

2.4.1. Newly arrived weather personnel must accomplish local task certification before they are considered fully qualified. Enlisted certification procedures are established in AFI 36-2201 and in the 1W0X1A Career Field Education and Training Plan (1W0X1A CFETP). As weather personnel advance in skill level, each individual's breadth and depth of knowledge increases. However, unless the individual periodically performs those functions more commonly carried out in junior positions, skill in the basic tenets of weather observing and forecasting will be lost. To foster continuance of these skills, weather unit leadership must ensure individuals can function effectively in the core competencies.

2.4.2. **Enlisted.** New arrivals that already have forecasting and observing experience generally have shorter qualification training periods than recent technical school graduates. Weather flight trainers perform a review of previously certified tasks and orient new personnel to the peculiarities of the local mission, aircraft sensitivities, and local weather regimes. After the unit trainers are satisfied, new weather personnel can perform all core functions in the weather workcenter, task certifiers formally certify these new arrivals using locally developed procedures, and procedures outlined in AFI 15-180. These procedures involve the following actions: written tests, performance tests, oral review of tasks, and certification documented on AF Form 1098 or a locally approved form.

2.4.3. The rules for identifying qualified unit trainers and task certifiers in the weather career field are the same as those established for the rest of the Air Force. AFI 36-2201 has more information on this topic along with your local base EST manager. Training milestones and weather career progression paths are outlined in part 1 of the 1W0X1A CFETP. This document also identifies the core tasks necessary to attain skill-level upgrade training goals. Note that new technical school graduates are never assigned to short tour areas.

2.4.4. **Officer.** All new weather officers are required to become forecaster task certified. Officer certification procedures for new arrivals are similar to those of enlisted personnel. New weather officers receive orientation to the local mission, aircraft sensitivities, and local weather regimes from unit trainers. Officers become certified when they can perform all core functions in the weather workcenter. This certification is normally documented on an AF Form 1098. For additional information, see AFI 15-180.

Section C - Publications/References

3.1. Attachment 1 lists the current weather publications available to all PACAF weather units. These instructions and manuals provide units with all necessary weather station operational management and technical leadership information. A brief description of the more frequently used instructions has been included in this pamphlet. HQ PACAF/DOW is the OPR for providing meteorological technical assistance and actively encourages weather flights to contact us whenever they need additional technical guidance.

3.2. Technical Library. Every weather flight in PACAF maintains a library with the help of the base head librarian. The technical weather library should have publications pertinent to local operations. It is the responsibility of the local weather flight to tailor the contents of their technical weather library to meet the needs of their supported warfighters. The technical weather library can be a good source of climatological, basic, and advanced meteorological information. The following agencies can provide additional guidance on library maintenance: HQ PACAF/DOWO, Air Force Weather Technical Library at the Air Force Combat Climatological Center, and of course the base librarian.

3.3. HQ PACAF/DOW Homepage:

3.3.1. HQ PACAF Weather Division (DOW) developed an unclassified weather web page providing links to information such as:
3.3.1.1. Performance metrics for each weather unit.
3.3.1.2. The latest Air Force Weather Technical Standardization & Evaluation (AFWTSE) reports, updated checklists, visit schedule, and any other pertinent info regarding the AFWTSE program.
3.3.1.3. The most current information discussing weather communications, programs, systems and certification and accreditation programs.
3.3.1.4. The DOW Newsletter contains the latest information affecting all aspects of the weather carrier field, weather systems, training and numerous other subjects.
3.3.2. In addition to the HQ PACAF/DOW homepage, AFWA also has numerous, high-quality centralized weather products, including state-of-the-art weather visualization products aimed at the non-weather technical community available on the "Air Force Weather Information Network" (AFWIN) web server. Both services (AFWIN and the HQ PACAF/DOW homepage) are currently available for military use. We strongly recommend that all military organizations take time to become familiar with these valuable sources of on-demand weather information.

Section D - Visit Programs

4.1. General. Technical assistance visits are available to assist the weather units. Units are encouraged to seek technical assistance whenever needed. Command and Air Force-level evaluation and inspection visits can also be expected.

4.2. SAV. The Staff Assistance Visit (SAV) team consists of two-to-three persons from HQ PACAF/DOW. The team spends up to a week with a unit to review anything the weather flight requests for possible enhancement. SAVs can look at all areas of weather support including meteorological processes, weather station operating policies and procedures, support agreements, and technology integration. The team works closely with the unit's leadership to help document a standard technical and procedural methodology for all unit personnel to follow. These visits are conducted on a non-attribution basis and are scheduled by unit invitation only. SAVs can be requested by official memo to HQ PACAF/DOWO.

4.3. AFWTSE. Air Force Weather Technical Standardization and Evaluation (AFWTSE) is an HQ USAF-directed program to evaluate the ability of weather flights to meet USAF weather standards and the weather forecasting and observing requirements of their warfighting users. The AFWTSE is compliance oriented and is conducted using checklists developed by HQ AFWA/XOV. The AFWTSE team membership consists of three to four personnel from HQ PACAF/DOW and one member from HQ AFWA/XOV. Team members administer proficiency tests, give checkrides, and run checklists during the visits. Weather units can expect an AFWTSE visit once every two years. ATSEP and AFWTSE visits are usually scheduled to occur simultaneously. For more information contact HQ PACAF/DOWV, DSN 315-448-2033/9282.

4.4. ATSEP. The Air Traffic System Evaluation Program (ATSEP) visit focuses on the effectiveness of weather support to the Air Traffic Control (ATC) community, the supervisor of flying function, and the local flying squadrons. Weather impacts on air traffic control operations are evaluated from an operational and management perspective. This is accomplished by having a weather representative on the ATSEP team evaluate the total air traffic system, related flight procedures, and flight support systems for compatibility, adequacy, and safety. For more information contact HQ PACAF/DOWV, DSN 315-448-2033/9282.

4.5. CERI. The Combat Employment Readiness Inspection (CERI) tests a unit's capability to perform its wartime mission. A weather representative on the IG team will evaluate a weather unit's wartime capability by having the weather flight perform its wartime mission both in-place and in a deployed mode of operation. This can also include having the weather flight operate out of its alternate observing and forecasting sites. Contact HQ PACAF/DOWV, DSN 315-448-2033/9282.

4.6. MTT. The Mobil Training Team (MTT) supplements, and is equivalent to, formal in residence training. Teams go directly to the operating location to perform training. The most common MTTs are those for new equipment installations, or existing equipment upgrades. MTTs work with weather units prior to arrival to ensure the greatest number of personnel receives the available training.

Section E - Metric Program

5.1. General.

5.1.1. The HQ PACAF weather metrics program implements and expands the Air Force Weather (AFW) evaluation program (AFI 15-114) which is based on the principles of accuracy, timeliness, relevance to the operational user, unity of effort, and readiness of weather services to satisfy USAF and Army operational requirements. Meaningful metrics should be used at all levels (tactical, operational, and strategic) to assess the technical health and operational effectiveness of AFW services.

5.1.2. PACAF's metrics program incorporates three major forecast verification procedures used to measure the accuracy of forecasts issued to the customer. Terminal Aerodrome Forecast Verification (TAFVER) is a verification of specified categories of ceiling and visibility in terminal forecasts. This is used to evaluate weather forecast quality and trends. Operational Verification (OPVER) is the verification of weather criteria that directly or indirectly affect supported command operations. It is used to evaluate and document the quality of weather support provided by individual units to their operational mission. The forecast products to be verified are chosen based on their importance to supported agencies and on the necessity to maintain a historical database. OPVER provides a measure of AFW units' operational effectiveness, whereas TAFVER is used as a diagnostic tool to monitor AFW technical performance as a whole. Weather warning and weather advisory (WW/WA) verification data are also used to evaluate the weather unit's ability to predict significant adverse weather events to satisfy Air Force and Army operational and resource protection requirements.

5.1.3. The employment of meaningful metrics provides the weather unit, host base or post, and HQ PACAF leadership with data to improve management and technical processes. This tiered accountability process allows each echelon of leadership to evaluate their data, modify procedures, training programs, or other processes in order to improve warfighter support. Examples of how these data can be used include the following:

5.1.3.1. Identifying the strengths and weakness of individual and unit forecast capabilities, weather patterns or events that most frequently impact operations, significant forecast challenges, and to focus training efforts where most needed.

5.1.3.2. Provision of quantitative measures of individual and unit forecast performance for use in feedback sessions, performance reports, and awards.

5.1.3.3. Identifying theater-wide forecast capabilities and problems will enable HQ PACAF/DOW to determine the best assistance mechanism (e.g., training, SAV) and ensure optimal use of TDY and training funds.

5.1.3.4. Identifying deficiencies or weaknesses in current AF and PACAF policies and procedures.

5.1.3.5. Identifying shortfalls in current technology and communications systems.

5.2. Terminal Aerodrome Forecast Verification (TAFVER):
5.2.1. TAFVER provides a long-term constant factor to evaluate trends in a weather unit's forecasting skills. The statistics provide a coarse scale look at forecasting trends on a monthly, seasonal, or annual basis to ascertain the technical health of AFW forecasting capabilities. TAFVER provides a technical measure of AFW's capability to forecast specified ceiling and visibility criteria (not necessarily operational thresholds) for given points in time for each weather terminal aerodrome forecast (TAF) producing unit.
5.2.2. All PACAF units that issue TAFs covering operationally significant periods will verify each TAF and measure individual and unit forecast accuracy for the following criteria at the 3-, 6-, 12-, and 18-hour points:
5.2.2.1. Ceiling/visibility (CIG/VIS) category of less then 1500 ft and/or 3 mi (HQ USAF/XOW requirement).
5.2.2.2. CIG/VIS category of less than 3000 ft and/or 3 mi at Wheeler AAF, HI, Andersen AFB, Guam, and Kadena AB, Japan (HQ PACAF/DOW requirement added due to infrequent forecast opportunities for ceilings less than 1500 ft and visibilities less than 3 miles).

5.3. Operational Verification (OPVER):
5.3.1. Program requirements. All units with forecast responsibilities (including non-TAF producing forecast units, and operational weather squadrons) have an OPVER program.
5.3.2. Verification criteria is based on go/no-go thresholds that are critical to operations. If a go/no-go threshold cannot be defined, values at which the decision maker's thinking begins to be influenced are used. Note, these criteria are intended to be among the top concerns of the supported warfighter, be measurable and have sufficient opportunities to measure. Observations used to verify these forecasts must be accurate and almost always available. At units where forecasters are integrated into flying squadrons, pilot debriefs may be the primary source of verification information depending on the criteria chosen.
5.3.3. All PACAF units that issue TAFs covering operationally significant periods verify at least one additional TAF-specified operational criterion (in addition to the CIG/VIS of 1500/ 3 & 3000/ 3 criteria) at those 3, 6, 12, and 18 hour points that are operationally significant.
5.3.4. All weather units that issue mission execution forecasts to customers verify at least one additional forecast element not specified in the TAF. Selection of this element should be from elements and/or thresholds that have the greatest impact on a supported agency's tactic or mission. For example, this element could be selected from a range forecast, a low altitude training route forecast, an air-refueling forecast, a drop zone forecast, a tactical decision aid forecast, etc. This element is verified for at least 1 year. Units verify at one or more operationally significant verification hours since many operations are conducted over a time period of several hours. After 1 year a new element may be substituted.
5.3.5. HQ PACAF/DOW approves unit-selected elements and may waive portions of OPVER requirements for units not having a forecasting function of sufficient scope to warrant selecting the required number of verification elements.

5.4. Weather Warning/Advisory (WW/WA) Verification: Weather units with forecast and/or observing functions coordinate with their supported agencies to identify WW/WA requirements which impact local operations. They verify for the timeliness and accuracy of all WW/WAs issued to include weather events for which a warning or advisory was not issued. The office issuing the weather warning or advisory performs the verification function. A weather warning (WW) is a special notice provided to local agencies to alert them to weather conditions of such intensity as to pose a hazard to life or property for which the local agencies must take protective action (e.g., tornadoes, thunderstorms with winds greater than or equal to 50 kts or hail greater than or equal to 3/4 inch, winter storms, blizzards). A weather advisory (WA) is a special notice provided to

local agencies to alert them to weather conditions that could affect their operations. These can be either forecast or observed advisories based on requirements of supported agencies to take some protective action or just be made aware of. Only forecast WW/WA products require upchanneled metrics. Units should monitor observed WA for timeliness. (Note: The AFW Lightning Watch will be treated as a weather warning with 30 minute desired lead time for metrics verification purposes).

5.5. Performance measures. The following are the most common measurements used by higher headquarters to evaluate weather services provided by the weather unit (NOTE: calculations can be found in USAFETAC/TN 93/003 and AWS publication, For Your Information, #22):

5.5.1. AFW Forecast Skill Score (FSS). A weighted score that represents how well the weather station performed against a standard, usually persistence. It applies to TAFs and can be applied to OPVER when persistence is known.

5.5.2. Forecast Percent Correct (%COR). This is the simplest statistical measure in that it is the number of correctly forecast events divided by the total number forecasts issued. Scores range from zero to one, with a score of one being perfect forecast performance. It applies to TAFs and OPVER.

5.5.3. Capability (CAP). This is the percentage of how often the occurrence of a specified event is correctly forecasted divided by the total number of occurrences. The score ranges from zero to one with a score of one being perfect. It applies to TAFs, WW/WAs, and OPVER. When applied to WW/WA, a correct forecast occurs when the WW/WA verifies with positive lead time.

5.5.4. Quality Performance Measure (QPM). Applies to WW/WA. Is the capability where a correct forecast occurs when the WW/WA verifies with desired lead time.

5.5.5. Reliability (REL). This is the percentage of how often the occurrence of a specified event is correctly forecasted divided by the total number of times we said it was forecasted to occur. The score ranges from zero to one with a score of one being perfect. It applies to TAFs, WW/WAs, and OPVER.

5.5.6. Critical Success Indicator (CSI). This metric is essentially a combination of the capability and reliability scores described above. It can be described as the ratio of correct forecasts to the total number of times an event was either forecast or observed. It is also known as forecast efficiency. The score ranges from zero to one with a score of one being perfect. In most cases, CSI will yield a lower score than reliability because it includes the missed events from the capability score. It applies to TAFs, WW/WAs, and OPVER.

5.5.7. False Alarm Rate (FAR). The ratio of forecasts that do not verify to total forecasts issued, i.e., the forecasted event does not occur. It applies to TAFs, WW/WAs, and OPVER.

5.6. Reporting Procedures:

5.6.1. All weather units providing direct operational support inform their supported agencies of the effectiveness of forecast support. At a minimum, they provide TAFVER, WW/WA, and OPVER information at least quarterly and include a comparison of weather service to no weather service. Weather units are encouraged to brief their supported agencies on the effectiveness of all key services provided.

5.6.2. PACAF weather units provide TAFVER, OPVER, and WW/WA data (via Excel spreadsheets provided by HQ PACAF/DOWO) to HQ PACAF/DOWO by the 15th day of the month for the previous month's data. HQ PACAF/DOWO then compiles command-wide data and reports it to HQ Air Force Weather Agency by the 25th of each month. HQ PACAF/DOWO has an Aerospace Scientist available who can assist weather units in any areas found technically deficient by the metrics data.

5.7. HQ PACAF/DOWO, DSN (315) 449-7379, is the POC for HQ PACAF Weather Metrics.

Section F - Weather Equipment and Communications

6.1. Fixed Equipment. Fixed Weather equipment includes airfield instrumentation to measure temperature, cloud height, wind, and visibility; and computer equipment used to ingest, process, display and disseminate weather data. This equipment is essential to weather station operations. In most cases there is not a viable backup for fixed airfield equipment, and those backups in existence only provide a limited ability to accurately produce weather observations and mission oriented forecasts.

6.2. Outages. Equipment and communications outages seriously degrade the weather station's ability to provide quality resource protection and flight safety information. Equipment and communications outages must be managed aggressively with daily contacts to those agencies responsible for weather equipment maintenance. Considering the remoteness of most locations, replacement parts must be given the appropriate priority to minimize the impact of shipping delays. Finally, PACAFI 15-103 requires outage reports for any outage (equipment or circuit) that has lasted for or is expected to last more than 48 hours.

THOMAS C. WASKOW, Maj Gen, USAF
Director of Air and Space Operations

1 Attachment
Weather Publications

Attachment 1
WEATHER PUBLICATIONS

A1.1. Air Force Weather Publications:

AFDD 45	Aerospace Weather Operations
AFPD 11-2	Aircraft Rules and Procedures
AFPD 15-1	Atmosphere and Space Environmental Support
AFI 11-203V3	General Flight Rules
AFI 13-203	Air Traffic Control (Sets guidance for training of air traffic control personnel to take limited weather observations)
AFI 15-107	Weather Modification
AFI 15-114	Evaluation of Weather Products and Services (Sets guidance for technical health programs)
AFI 15-118	Requesting Specialized Weather Support (Support Assistance Request (SAR) guidance)
AFI 15-126	Aerospace Weather Operations - Roles and Responsibilities
AFI 15-180	AF Weather Standardization & Evaluation Program (Stan/Eval checklist)
AFI 36-2923	Aeronautical Duty and Occupational Badges
AFMAN 15-111	Surface Weather Observations
AFMAN 15-112	Upper Air Observations
AFMAN 15-113	Weather Radar Observations
AFMAN 15-124	Meteorological Codes
AFMAN 15-125	Weather Station Operations
AFMAN 15-129	Aerospace Weather Operations - Processes and Procedures
AFM 105-4	Weather Support for Army Tactical Operations (will become AFJPAM 15-127)
AFM 105-7	Field Behavior of NBC Agents (including smoke and incendiaries; will become AFMAN 32-4009)
AFJI 15-157	Weather Support for the US Army
AFMS 34A1	Weather Flight (Manpower Standard)
AFMAN 15-162	Space Weather Observations
AFPAM 15-160	World Meteorological Organization Codes

A1.2. Visual Aids Still Current:

VA 15-120	METAR Code Plotting Guide
VA 15-126	Key to METAR and TAF Codes
VA 105-2	Wind Plotting Guide
VA 105-6	Airways Code Plotting Guide
VA 105-10	TARWI Code (Jul 92)
VA 15-117	Synoptic Code Plotting Guide
VA 105-35	D-Value Computation Chart (Jul 92)

A1.3. Air Force Weather Publications Being Published:

AFCAT 15-152:
Vol. 1, Weather Graphics (formerly AWSP 105-52 V1)
Vol. 2, Station Catalog
Vol. 3, Message Catalog
Vol. 4, Climatological Products Services Catalog
Vol. 5, Space Environmental Products, 7 Nov 94 ("X" Distribution)

A1.4. Other PACAF Weather Publications:

PACAFCAT 15-1	HFRB Teletype Data Packages OPlans & Levels Catalog
PACAFI 15-101	Weather Support for PACAF
PACAFI 15-102	Tropical Cyclone Reconnaissance(Procedures and responsibilities for primary and alternate Joint Typhoon Warning Centers)
PACAFI 15-103	Weather Communications and Sensing Equipment Outage Reporting
PACAFI 15-104	Regional Briefing System
PACAFI 15-105	HFRB System Operations
PACAFI 15-106	Weather Specialty Wartime Proficiency Training
AFMAN 15-111/PACAF SUP1	Surface Weather Observations
AFMAN 15-124/PACAF SUP1	Meteorological Codes
AFMAN 15-180/PACAF SUP-1	Air Force Weather Standardization and Evaluation Program

A1.5. Recurring Weather Publications. The following is a list of recurring periodicals. These publications contain up-to-date information on a myriad of issues and events affecting the Air Force weather career field. Your units should already be on automatic distribution for these periodicals.

A1.5.1. Air Force Weather Observer Magazine - published monthly by Air Force Weather Agency; informational in nature; programs, policies, and training.

A1.5.2. Air Force Weather Operations Digest - published monthly by Air Force Weather Agency; technical operational guidance on weather station management.